

DOCUMENT RESUME

ED 274 320

IR 012 300

AUTHOR Winans, Glen T.
TITLE Microcomputers in Academic Departments: The Consequences of Implementing Distributive Desk-Top Computing to Faculty and Staff.
PUB DATE 15 Apr 86
NOTE 9p.; Paper presented at the IBM Seminar for Deans of Arts and Letters (Santa Cruz, CA, April 15, 1986).
PUB TYPE Reports - Descriptive (141) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Administration; College Faculty; *Departments; Environmental Influences; Financial Support; Higher Education; *Microcomputers; Organizational Change; *Program Implementation; Purchasing; *Recordkeeping; *Research Universities; Word Processing

IDENTIFIERS IBM Personal Computer

ABSTRACT

This paper presents a descriptive review of how the Provost's Office of the College of Letters and Science at the University of California, Santa Barbara (UCSB) implemented 330 microcomputers in the 34 academic departments from July 1984 through June 1986. The decision to implement stand-alone microcomputers was based on four concerns: increasing demand for low-cost computing; increasing demand for greater access to computers for academic and administrative work; increasing dissatisfaction with existing centralized computing services; and increasing interest in minicomputer and microcomputer applications. Microcomputers were selected to achieve the goals of enhancing faculty productivity by providing access to computing and administrative support by automating recordkeeping and word processing at the departmental level. The IBM Personal Computer (IBM PC) was selected for the academic departments. Implementation of the IBM PCs has resulted in (1) increased productivity of both faculty and staff; (2) increased faculty independence; (3) changed expectations for turnaround time on work assignments; (4) the need for additional personnel to provide quality user support; (5) the IBM PCs' becoming status symbols; (6) an exponential increase in department expectations; and (7) improved interdepartmental communication. It was also found that standardization was both a negative and a positive factor; shared use of the IBM PCs was ineffective; departments were unprepared to manage the new resource properly; centralized computing was adversely affected; IBM was unprepared to respond to the unique organizational nature of a modern university. (DJR)

* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION
CENTER (ERIC)

☒ This document has been reproduced as
received from the person or organization
originating it.
☐ Minor changes have been made to improve
reproduction quality.

• Points of view or opinions stated in this docu-
ment do not necessarily represent official
OERI position or policy.

**"MICROCOMPUTERS IN ACADEMIC DEPARTMENTS:
THE CONSEQUENCES OF IMPLEMENTING DISTRIBUTIVE
DESK-TOP COMPUTING TO FACULTY AND STAFF"**

A presentation at the IBM Seminar for Deans of Arts and Letters
Santa Cruz, California - April 15, 1986

By:
Glen T. Winans
Assistant Provost
College of Letters and Science
University of California
Santa Barbara, CA 93106

BEST COPY AVAILABLE

"PERMISSION TO REPRODUCE THIS
MATERIAL HAS BEEN GRANTED BY

Glen T. Winans

TO THE EDUCATIONAL RESOURCES
INFORMATION CENTER (ERIC)."

ED274320

IR012300

Introduction

The intent of this paper is to present a descriptive review of how the Provost's Office of the College of Letters and Science at the University of California, Santa Barbara (UCSB) implemented 330 microcomputers in 34 academic departments during the two-year period from July 1984 through June 1986. The paper refers to both academic computing and administrative computing in academic departments. For purposes of definition, academic computing is viewed as those computing activities undertaken by faculty in support of instruction or research, while administrative computing is viewed as those computing activities undertaken by staff to provide automated logistical support to faculty at the departmental level.

This discussion focuses exclusively on academic departments within a medium-sized public research university, and the process of implementing microcomputers to enhance academic and administrative computing in academic departments. It is beyond the scope of this paper to review the nature of academic departments as unique organizational units within an institutional setting, but it is important to remember that the governance structure and operational aspects of academic departments differ considerably from other non-academic units. Consequently, the experiences of the College of Letters and Science at UCSB are best generalized to academic departments in other universities, and not to the non-academic segments of institutions.

Computing Philosophy of the College

In 1983, on the basis of a) input from faculty and staff in academic departments, b) site visits to other UC campuses, and c) the conclusions of an independent consultant's report, the Provost's Office of the College of Letters and Science at UCSB adopted a formal operating policy encouraging the implementation of stand-alone microcomputing wherever possible to facilitate a broad range of academic and administrative computing needs. This decision ultimately led to the distribution of 330 IBM PC's to the 34 academic departments and programs within the College during the two-year period from July 1984 through June 1986.

Adoption of this policy represented clear recognition of the forces behind the "new wave" of integrated low-cost computing and communication technologies noted by John W. McCredie in Campus Computing Strategies (1983, pg. 4). McCredie's observation that "the rapid development and spread of microcomputers was accelerating the decentralization of computing resources on campuses" (pg. 8) was particularly germane to the situation at UCSB, where the struggle for "computing independence" was a paramount issue to many faculty.

This struggle was most evident in four concerns regarding academic and administrative computing which were repeatedly voiced by faculty and staff in a variety of disciplinary areas:

Computing Concerns of Academic Departments

1. Increasing demand for low-cost computing
2. Increasing demand for greater access to computing for academic and administrative work
3. Increasing dissatisfaction with existing centralized computing services
4. Increasing interest in minicomputer and microcomputer applications

The presence of these concerns across a wide spectrum of diverse disciplines and potential computing users set the stage for an intensive two-year effort to rapidly expand computing capacity in academic departments.

The Decision to Use Microcomputers

The decision to emphasize decentralized stand-alone microcomputing was intended to satisfy two goals: 1) enhance faculty productivity by increasing access to computing; and 2) enhance administrative support to chairpersons and faculty by automating recordkeeping and word processing at the departmental level.

Microcomputers were selected to help achieve these goals due to a number of clear advantages:

Advantages of Microcomputers for Departments

- *Adaptable to large/small environments
- *Ease of operation
- *Expandable
- *Local control of systems
- *Low-cost start-up
- *Multiple applications and uses
- *Networking capabilities
- *Portable
- *Real-time processing
- *Shared use

The next question was to determine which microcomputer to purchase for academic departments. The Provost's Office decision to select IBM was based on three key factors. First, IBM had a proven track record as a hardware vendor and the College had confidence that IBM would still be around five years down the road. Second, the existing and future product development plans for the IBM Personal Computer (PC) provided desired expandability and adaptability without compromising the critical need for hardware standardization. Third, a very important factor was the price discounts available, including a 37% price reduction on bulk purchases of 50 or more PC's. In addition, IBM offered

loaner equipment through their Educational Development Program, by which the campus could receive PC's free-of-charge for six months and then purchase some or all of the loaned hardware and software at the end of this period at a 43% price reduction.

Implementation of Microcomputers

The College developed a flexible implementation plan for purchasing, testing, and installing 330 PC's in the two-year period from July 1984 through June 1986. The plan itself did not consist of a single document, but rather was the product of simultaneous efforts aimed at expanding available academic and administrative computing in order to accomplish the following: 1) provide "PC's on Wheels" in each department whereby faculty could share mobile PC's for word processing purposes to aid in preparation of initial drafts of papers, proposals, course materials, correspondence and other items; 2) provide specially configured PC's, PC/XT's, or PC/AT's for faculty to use in data analysis and problem solving in their research or for curriculum development; and 3) provide improved administrative computing support to faculty at the departmental level through development of an Automated Recordkeeping System (ARCS) to assist with resource management and real-time bookkeeping, plus automation of department office functions such as word processing and student records.

The utilization patterns of the 330 PC's for academic and administrative computing in Letters and Science departments is as follows:

Utilization of PC's

<u>Purpose</u>	<u>Qty</u>	<u>%</u>
Academic Computing	205	62%
Administrative Computing	80	24%
Combined Use	45	14%
Totals	330	100%

The actual purchase of the 330 PC's was handled one of two ways. Either the Provost's Office sponsored the PC purchase (through the IBM Educational Development Program, a bulk purchase arrangement, or as part of the distribution of administrative computing systems) or the department purchased the PC (using allocated equipment funds, extramural contract and grant funds, or overhead funds). The Provost's Office directly purchased 238 PC's or 72% of the total, including 91 loaner PC's as part of IBM's Educational Development Program, and departments directly purchased 92 PC's or 28% of the total. The Provost's Office also established an Administrative Computing Services (ACS) unit to coordinate all logistical support for the growing number of microcomputers in departments. This included 4.00 full-time staff engaged in a variety of support activities, such as,

hardware and software testing and evaluation; systems development, implementation, and maintenance; user training; equipment delivery, installation, and repair; and other computer-related duties.

Consequences of Implementing Microcomputers

As with any significant organizational change, the mass distribution of such a large number of microcomputers in a relatively short time span impacted departmental lifestyles. A number of unforeseen consequences occurred, although the overall reaction of faculty and staff across disciplines was extremely favorable. Below is a review of thirteen significant consequences (the order does not reflect any ranking):

1. Computer Literacy Enhanced Productivity - A very positive outcome from the distribution of microcomputers was a marked increase in productivity by both faculty and staff in departments. Faculty using PC's for initial preparation of text and proposals were enthusiastic about the gains in their personal productivity as writing became easier and quicker. Staff using PC's for recordkeeping and word processing found they accomplished more in less time, and that revisions and updates did not create the emotional turmoil that once seriously impacted clerical staff morale. Faculty also found that their ability to experiment with computing for various instructional and research purposes was enhanced through microcomputers due to reduced costs and ease of operation.
2. Standardization Was A Two-Edged Sword - The decision to standardize microcomputer hardware throughout the College was basically a mixed blessing. On the one hand, standardization was a positive factor in simplifying testing, installation, and maintenance of hardware, and in streamlining software development and training. This was especially true in administrative systems development, where staff user groups were formed to help design initial systems and to facilitate training. On the other hand, standardization was a negative factor to some faculty because it was limiting. Faculty were generally accustomed to freedom of choice, and there was some resistance to distribution of a single product. Ultimately, these faculty concerns really reflected a broader interest in control over academic decision making in areas of new technology.
3. PC's Facilitated Faculty Independence - The advantages of microcomputers afforded a form of technology best-suited to faculty behavior because of features such as portability, expandability, and a stand-alone operating system. In essence, the PC represented a technological extension in computing of how faculty view themselves within the academic organization: decentralized and fully independent. Hence, PC's facilitated the natural independence and creativity of faculty in conducting their teaching and research.

4. Real-Time Computing Changed Expectations - A fundamental change brought about by the implementation of microcomputers into academic departments was the advent of real-time computing. The presence of real-time computing altered the demands for information and faculty expectations of turn-around time on work assignments. Some staff found themselves being asked more questions and given more work, while other staff were threatened and confused by the loss of a "time lag" in the preparation and recording of transactions in real-time systems.
5. User Support Was Necessary But Expensive - Not surprisingly, quality user support was necessary for the mass distribution of microcomputers to be successful. Without the presence of full-time ACS staff to oversee ordering, testing, installation, maintenance, and training activities, the mass distribution of PC's would have been unsuccessful. Quality user support also was quite expensive because it was so labor intensive. Each new installation added a multiplier effect to user support costs which were often unaffected by economies of scale. Although standardization and mass distribution had the advantage of reducing hardware acquisition costs and fostering lower group rates for maintenance and insurance, it had the disadvantage of increasing personnel costs due to the need for one-on-one consultation and user training.
6. PC's Became Status Symbols - An unforeseen consequence of the phased distribution of PC's was that the College created a new "status symbol" for faculty and staff. While the Provost's Office believed that the distribution would more than satisfy demand, in reality it established a new measure of institutional prestige. Everyone wanted their own PC on their desk in their office. Faculty and staff with PC's had new stature; those without PC's did not. The result was a predictable outcome from the laws of economics: PC's became highly valued and scarce, hence demand for PC's increased dramatically.
7. Shared Use By Faculty Was Ineffective - Related to the creation of the PC as a "status symbol" was the failure of the "PC's on Wheels" approach to work effectively in most departments. The assumption that faculty would share the use of PC's ignored a basic principle of human behavior: "possession is nine-tenths of the law". The idea of implementing mobile PC's was a well-intentioned attempt to recognize that faculty prefer to work in their offices rather than to share a microcomputer facility within the department. However, once individual faculty moved a shared PC to their office, it usually became their PC and was not available for use elsewhere.

8. Departmental Expectations Increased Exponentially - The proliferation of microcomputers throughout the College and the accompanying development of new systems to help address academic and administrative needs led to exponential growth in departmental expectations for computing. The widespread applicability of microcomputers for handling a vast array of tasks and the College's responsiveness in providing this technology created an even greater demand for hardware and software. Departments began to take for granted that PC's would be as commonplace as telephones, although they perceived that the continued distribution of microcomputers was mutually exclusive from other departmental needs. Ultimately, this led to conflict over departmental priorities as the ability to acquire additional PC's was dependent upon a willingness to forego other budgetary demands.
9. Managing Microcomputers Was Difficult For Departments - As the distribution of microcomputers continued and the number of PC's in each department increased, it was quickly apparent that departments were unprepared to properly manage this new resource. Questions such as scheduling the use of PC's, software selection, access to equipment by staff and students, interfacing or networking various computing resources, and others, plagued departments. Rarely did a department have sufficient expertise to easily resolve such questions, so solutions evolved slowly through a painstaking process of trial and error. In some departments, this meant that the first faculty or staff member to master the hardware and software exerted substantial influence on departmental decision-making, and often in a narrowly-focused direction.
10. Interdepartmental Communication Was Improved - A small but clearly tangible consequence of implementing such a large number of PC's was improved communications and a closer working relationship between the Provost's Office and departments, as well as between departments themselves. There was greater understanding of shared needs and problems within the College, and departments actively sought advice and counsel from other departments on academic and administrative computing issues.
11. Centralized Computing Was Adversely Affected - The decentralized computing philosophy of the College and the decision to implement microcomputers in academic departments impacted the centralized computing services at UCSB in a number of significant ways. First, the costs of central mainframe computing continued to increase as academics redirected their computing business to departmental minicomputers and microcomputers. Second, central computing services evolved into basically an administrative computing center and central computing staff were not as actively involved in the mainstream activities and developments with academic computing. Third, some adversarial feelings emerged

between those advocating mainframe computing versus those advocating microcomputing. However, the real issue was not technology-centered, but resource-centered, since the distribution of PC's represented a continuing decentralization of resources away from a single centralized mainframe computing service.

12. IBM Was Unprepared for the Academic Marketplace - A "real life" lesson from the distribution of microcomputers was that IBM was unprepared to respond to the unique organizational nature of a modern university. IBM's approach was ill-suited to the temperament of the academic marketplace or the politics of academia. Their time-honored marketing strategies could not respond to disciplinary differences or the individualistic creativeness and skepticism of research faculty. The result was that the Provost's Office spent an inordinate amount of time educating IBM about academic governance and university organization, and suffered a loss of credibility with some faculty concerning the decision to standardize equipment. Although this outcome was probably unavoidable regardless of the vendor selected, the failure to account for IBM's lack of preparation generated additional problems and consumed resources which otherwise could have been committed to other needs.
13. The Benefits Exceeded the Costs - Lastly, in evaluating the experience of the College with implementing 330 IBM PC's in 34 academic departments, it was clear that the benefits exceeded the costs. The phased distribution of microcomputers accomplished the goals it was intended to accomplish: 1) faculty productivity was enhanced through increased access to computing; and 2) administrative support to faculty at the departmental level was enhanced by automating recordkeeping and word processing. No other computing approach could have reached so many individuals in such a short period of time with such positive results. This is not to diminish the problems or unforeseen consequences, but rather acknowledges the general success of the phased distribution from an overall perspective. It also recognizes that the success of this implementation can not be evaluated on the basis of costs, but on the dramatic increase in computing capacity in academic departments.